

# Teacher's Scoring Guide

1STEP+



**Mathematics**  
**Applied Skills Assessment**

**Spring 2008**  
**Graduation Qualifying Exam Retest**

**Indiana Statewide Testing for Educational Progress**



Developed and published under contract with State of Indiana Department of Education by CTB/McGraw-Hill LLC, a subsidiary of The McGraw-Hill Companies, Inc., 20 Ryan Ranch Road, Monterey, California 93940-5703. Copyright © 2008 by State of Indiana Department of Education. All rights reserved. Expressly for use by State of Indiana educators and citizens. Only State of Indiana educators and citizens may copy, download, and/or print the document, located online at <http://www.doe.state.in.us>. Any other use or reproduction of this document, in whole or in part, requires written permission of State of Indiana Department of Education.

## INTRODUCTION

The *ISTEP+* GQE Retest was administered during the spring of 2008 to students who entered high school (Grade 9) after August 2003. This gave students another opportunity to pass the graduation qualifying examination. The GQE Retest consisted of two parts: (1) a multiple-choice section and (2) an applied skills section. Each part included two content areas, English/Language Arts and Mathematics. Students completed only the content area(s) of the test on which they did not previously meet the Indiana Academic Standards. The multiple-choice section of the GQE Retest was machine-scored. The applied skills section, which consisted of open-ended questions and a writing prompt, was hand-scored during March and April 2008.

The results of both the multiple-choice section and the applied skills section were returned to the schools in May 2008. Copies of student responses in the applied skills section were also returned to the schools in May 2008. It is the Indiana Department of Education's expectation that schools will take this opportunity to invite students and parents to sit down with teachers to discuss the results. To support this endeavor, the Indiana Department of Education has prepared the following *Teacher's Scoring Guide*. The purpose of this guide is to help teachers to:

- understand the methods used to score the GQE Retest Applied Skills Assessment, and
- discuss and interpret these results with students and parents.

In order to use this guide effectively, you will also need the Student Report and a copy of the student's work.

There are two scoring guides for the GQE Retest, English/Language Arts and Mathematics. In this Mathematics guide, you will find:

- an introduction,
- a list of the Mathematics Grade 8 and the Algebra I Indiana Academic Standards,\*
- rubrics (scoring rules) used to score the open-ended questions,
- anchor papers that are actual examples of student work (transcribed in this guide for clarity and ease of reading), and
- descriptions of the ways in which the response meets the rubric criteria for each of the score points.

When you review the contents of the scoring guide, keep in mind that this guide is an overview. If you have questions, write via e-mail ([istep@doe.state.in.us](mailto:istep@doe.state.in.us)) or call the Indiana Department of Education at (317) 232-9050.

\* The Mathematics academic standards assessed in the GQE Retest are a combination of the Grade 8 Mathematics and the Algebra I standards that were adopted in September 2000.

## **INTRODUCTION TO THE MATHEMATICS APPLIED SKILLS ASSESSMENT**

The Applied Skills Assessment in the GQE Retest that students took this past spring allowed students to demonstrate their understanding of Mathematics in a variety of ways, such as applying formulas, explaining a solution, transforming a figure, or interpreting a table or graph.

### **STRUCTURE**

The open-ended questions for the Mathematics Applied Skills Assessment were divided into two tests, Test 1 and Test 2. Each test consisted of eight open-ended questions. Students were permitted to use calculators on Test 2 but **not** on Test 1.

### **SCORING**

Each open-ended question was scored according to its own rubric. A rubric is a description of student performance that clearly articulates the requirements for each of the score points. Scoring rubrics are essential because they ensure that all papers are scored objectively. Each rubric for the Mathematics portion of this administration of the GQE Retest had a maximum possible score of two or three score points.

**NOTE:** Images of the questions and student work have been reduced to fit the format of this guide.

Rubrics describe the requirements for each score point level. The number of score point levels possible varies according to the requirements of each activity. The performance criteria (requirements) comprising the rubrics were established prior to testing to ensure that all responses are judged objectively.

1. Students should not be penalized for omitting:

- degree symbols
- dollar signs (\$) or cent signs (¢)
- zeros for place holders; for example, either 0.75 or .750 could be used
- labels for word problems; for example, *miles*

**NOTE:** Students WILL be penalized for use of incorrect labels.

2. Students should not be penalized for:

- spelling or grammar errors
- using abbreviations; for example, *ft* or *feet* would be acceptable

3. Students should be given credit for:

- entries in the workspace that indicate understanding of a complete process even if the response on the answer line is incorrect (i.e., the student would receive partial credit for questions with rubrics that allow for scoring the work)
- answers not written on the answer line; for example, an answer could be given in the workspace or in the explanation (however, in some cases, because of the multiple calculations in the workspace, placement of an answer on the answer line is necessary to determine which response the student intended). Students WILL be penalized for incorrect answers written on the answer line even if the correct answer appears in the workspace.

4. Students should be given credit for:

- bar graphs with bars of any width
- bar graphs with either horizontal or vertical bars
- circle graphs with data presented in any order
- line graphs only if lines connect the points

### **CONDITION CODES**

If a response is unscorable, it is assigned one of the following condition codes:

A Blank/No response/Refusal

B Illegible

C Written predominantly in a language other than English

D Insufficient response/Copied from text

## MATHEMATICS GRADE 8

### INDIANA ACADEMIC STANDARDS

#### ☐ **Number Sense**

Students know the properties of rational and irrational numbers expressed in a variety of forms. They understand and use exponents, powers, and roots.

#### ☐ **Computation**

Students compute with rational numbers expressed in a variety of forms. They solve problems involving ratios, proportions, and percentages.

#### ☐ **Algebra and Functions**

See the Algebra I Standards on the next page.

#### ☐ **Geometry**

Students deepen their understanding of plane and solid geometric shapes and properties by constructing shapes that meet given conditions, by identifying attributes of shapes, and by applying geometric concepts to solve problems.

#### ☐ **Measurement**

Students convert between units of measure and use rates and scale factors to solve problems. They compute the perimeter, area, and volume of geometric objects. They investigate how perimeter, area, and volume are affected by changes of scale.

#### ☐ **Data Analysis and Probability**

Students collect, organize, represent, and interpret relationships in data sets that have one or more variables. They determine probabilities and use them to make predictions about events.

#### ☐ **Problem Solving**

Students make decisions about how to approach problems and communicate their ideas. Students use strategies, skills, and concepts in finding and communicating solutions to problems. Students determine when a solution is complete and reasonable, and move beyond a particular problem by generalizing to other situations.

## **ALGEBRA I**

### **INDIANA ACADEMIC STANDARDS**

- ☐ **Operations with Real Numbers**  
Students simplify and compare expressions. They use rational exponents and simplify square roots.
- ☐ **Linear Equations and Inequalities**  
Students solve linear equations and inequalities in one variable. They solve word problems that involve linear equations, inequalities, or formulas.
- ☐ **Relations and Functions**  
Students sketch and interpret graphs representing given situations. They understand the concept of a function and analyze the graphs of functions.
- ☐ **Graphing Linear Equations and Inequalities**  
Students graph linear equations and inequalities in two variables. They write equations of lines and find and use the slope and y-intercept of lines. They use linear equations to model real data.
- ☐ **Pairs of Linear Equations and Inequalities**  
Students solve pairs of linear equations using graphs and using algebra. They solve pairs of linear inequalities using graphs. They solve word problems involving pairs of linear equations.
- ☐ **Polynomials**  
Students add, subtract, multiply, and divide polynomials. They factor quadratics.
- ☐ **Algebraic Fractions**  
Students simplify algebraic ratios and solve algebraic proportions.
- ☐ **Quadratic, Cubic, and Radical Equations**  
Students graph and solve quadratic and radical equations. They graph cubic equations.
- ☐ **Mathematical Reasoning and Problem Solving**  
Students use a variety of strategies to solve problems. Students develop and evaluate mathematical arguments and proofs.

Problem Solving is identified as a Process Skill in the Indiana Academic Standards. To ensure that the *ISTEP+* questions that assess this Process Skill are grade-appropriate and that the questions use skills that are contained in the standards, these questions are developed by including at least two different indicators from Content Skills in addition to the indicator from the Process Skill. Some of the Content Standards included in the Content Skills are Computation, Geometry, and Algebra. The additional indicators may be from the same or different Content Skills.

**NOTE:** For the Process Skill questions, score points are awarded **only** for the Process Skill, not for the Content Skill associated with the question.

The Content Skills used for each of the Process Skill questions in the GQE Retest Applied Skills Assessment are shown in the following chart.

### PROCESS SKILL QUESTIONS

Question	Process Skills	Content Skills <i>Item may map to more than one indicator in a standard.</i>
<b>Test 1</b>		
8	Problem Solving	Algebra and Functions, Geometry
<b>Test 2</b>		
3	Problem Solving	Algebra and Functions, Measurement
4	Problem Solving	Computation, Measurement
6	Problem Solving	Number Sense, Measurement
8	Problem Solving	Algebra and Functions, Measurement



## Test 1—Question 1: Algebra and Functions

- 1** Jamie is saving money to buy a CD player that will cost \$58, including tax. She has already saved \$16. She can earn \$6 per hour doing yard work. How many hours will Jamie need to work to earn enough money to buy the CD player?

**Show All Work**

**Answer** \_\_\_\_\_ hours

### Exemplary Response:

- 7 hours

Sample Process:

- $6h + 16 = 58$

$$6h = 42$$

$$h = 7$$

OR

- Other valid process

### Rubric:

**2 points** Exemplary response

**1 point** Correct complete process; error in computation

**0 points** Other

### Test 1—Question 1 Score Point 2

This response matches the exemplary response contained in the rubric. The student gives the correct answer of 7 hours. The response receives a Score Point 2.

#### SCORE POINT 2

- 1** Jamie is saving money to buy a CD player that will cost \$58, including tax. She has already saved \$16. She can earn \$6 per hour doing yard work. How many hours will Jamie need to work to earn enough money to buy the CD player?

**Show All Work**

$$\begin{array}{r} 58 \\ - 16 \\ \hline 42 \end{array} \qquad \begin{array}{r} 7 \\ 6 \overline{)42} \end{array}$$

**Answer** 7 hours

### Test 1—Question 1 Score Point 1

This response shows a correct complete process. However, a computational error is made when the student incorrectly divides 42 by 6, resulting in an incorrect answer of 8 hours instead of 7 hours. Therefore, this response receives a Score Point 1.

#### SCORE POINT 1

- 1** Jamie is saving money to buy a CD player that will cost \$58, including tax. She has already saved \$16. She can earn \$6 per hour doing yard work. How many hours will Jamie need to work to earn enough money to buy the CD player?

**Show All Work**

$$\begin{array}{r} 58 \\ - 16 \\ \hline 42 \end{array} \qquad \begin{array}{r} 8 \\ 6 \overline{)42} \end{array}$$

**Answer** 8 hours

**SCORE POINT 0**

- 1** Jamie is saving money to buy a CD player that will cost \$58, including tax. She has already saved \$16. She can earn \$6 per hour doing yard work. How many hours will Jamie need to work to earn enough money to buy the CD player?

**Show All Work**

$$\begin{array}{r} \phantom{0}^1 \\ \$58 \\ + \$16 \\ \hline 74 \end{array} \quad \$16$$

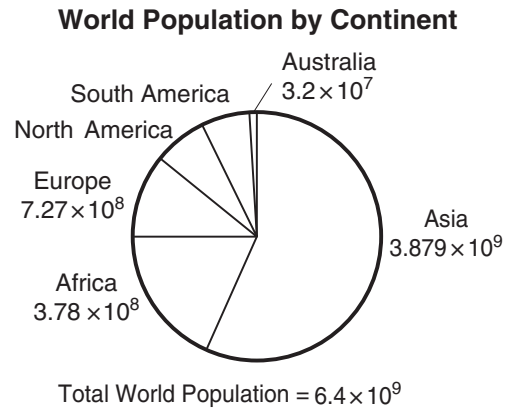
**Answer** 74 hours

**Test 1—Question 1  
Score Point 0**

This response shows an incorrect answer and an incorrect process. Therefore, this response receives a Score Point 0.

## Test 1—Question 2: Data Analysis and Probability

**2** Consider the circle graph below.



What is the total population of North America and South America?

**Show All Work**

**Answer** \_\_\_\_\_

### Exemplary Response:

- $1.384 \times 10^9$

Sample Process:

- N. and S. America  
$$= (6.4 \times 10^9) - (3.879 \times 10^9 + 3.78 \times 10^8 + 7.27 \times 10^8 + 3.2 \times 10^7)$$
$$= (6.4 \times 10^9) - (3.879 \times 10^9 + 0.378 \times 10^9 + 0.727 \times 10^9 + 0.032 \times 10^9)$$
$$= 6.4 \times 10^9 - 5.016 \times 10^9$$
$$= 1.384 \times 10^9$$

OR

- Other valid process

### Rubric:

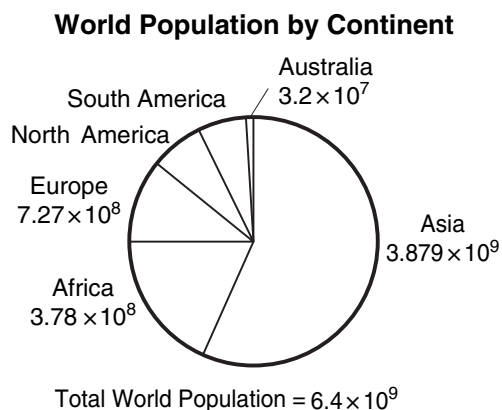
- 2 points** Exemplary response
- 1 point** Correct complete process; error in computation
- 0 points** Other

**Test 1—Question 2**  
**Score Point 2**

This response matches the exemplary response contained in the rubric. The student gives the correct answer of  $1.384 \times 10^9$ . The response receives a Score Point 2.

**SCORE POINT 2**

**2** Consider the circle graph below.



What is the total population of North America and South America?

**Show All Work**

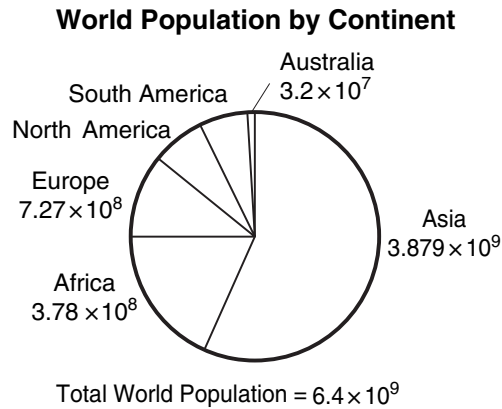
$$\begin{array}{r}
 6.40 \times 10^9 \\
 1.105 \times 10^9 \\
 + 0.032 \times 10^9 \\
 \hline
 1.137 \times 10^9 \\
 + 3.879 \times 10^9 \\
 \hline
 5.016 \times 10^9
 \end{array}$$

$$\begin{array}{r}
 \overset{1}{7}.\overset{1}{2}7 \\
 + 3.78 \\
 \hline
 11.05 \times 10^8 \\
 3 \ 9 \ 1 \\
 6.400 \times 10^9 \\
 - 5.016 \times 10^9 \\
 \hline
 1.384 \times 10^9
 \end{array}$$

**Answer**  $1.384 \times 10^9$

### SCORE POINT 1

- 2** Consider the circle graph below.



What is the total population of North America and South America?

**Show All Work**

$$\begin{array}{r} \phantom{000}^2 \phantom{00}^2 \phantom{00}^2 \\ 3.879 \\ .378 \\ .727 \\ + .032 \\ \hline 5.016 \end{array} \qquad \begin{array}{r} 6.400 \\ - 5.016 \\ \hline 1.394 \end{array}$$

**Answer**  $1.394 \times 10^9$

### Test 1—Question 2 Score Point 1

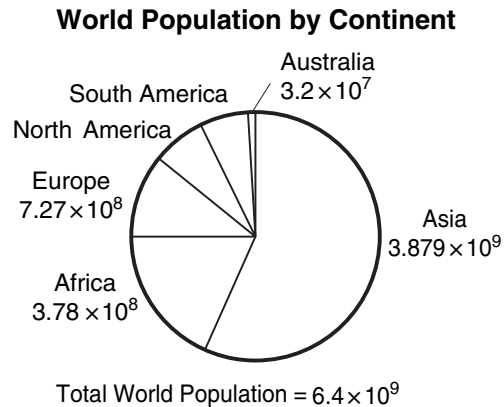
This response shows a correct complete process. However, a computational error is made when the student subtracts 5.016 from 6.400, resulting in an incorrect answer of  $1.394 \times 10^9$  instead of  $1.384 \times 10^9$ . Therefore, this response receives a Score Point 1.

**Test 1—Question 2**  
**Score Point 0**

This response shows an incorrect answer and an incorrect process. Therefore, this response receives a Score Point 0.

**SCORE POINT 0**

**2** Consider the circle graph below.



What is the total population of North America and South America?

**Show All Work**

$$\begin{array}{r}
 5 \ 13 \ 9 \ 10 \\
 6.400 \\
 - 3.879 \\
 \hline
 4 \ 11 \ 1 \\
 2.521 \\
 .378 \\
 \hline
 2.143
 \end{array}$$

$$\begin{array}{r}
 1 \ 3 \ 13 \\
 2.143 \\
 .727 \\
 \hline
 1.416 \\
 .708 \times 10^9 \\
 2 \overline{) 1.416} \\
 \underline{14} \\
 016 \\
 \underline{16}
 \end{array}$$

**Answer**  $.708 \times 10^9$



### Test 1—Question 3: Algebra and Functions

**3**

On the line below, write the slope-intercept form of  $4y + x = -9$ .



Equation \_\_\_\_\_

What are the slope and y-intercept of the equation?

Answer slope \_\_\_\_\_, y-intercept \_\_\_\_\_

#### Exemplary Response:

- $y = -\frac{1}{4}x - \frac{9}{4}$

OR

- Other valid equation in slope-intercept form

AND

- Slope:  $-\frac{1}{4}$

AND

- y-intercept:  $-\frac{9}{4}$

**NOTE:** Award 1 point for the correct slope and y-intercept based on an incorrect equation.

#### Rubric:

**2 points** Exemplary response

**1 point** Correct equation


OR

Correct slope and y-intercept

**0 points** Other


### Test 1—Question 3 Score Point 2

This response matches the exemplary response contained in the rubric. The student shows a correct equation, the correct slope, and the correct  $y$ -intercept. The response receives a Score Point 2.

SCORE POINT 2	
<b>3</b>	On the line below, write the slope-intercept form of $4y + x = -9$ .
	Equation $y = -\frac{1}{4}x - \frac{9}{4}$ $4y = -x - 9$ $y = -\frac{1}{4}x - \frac{9}{4}$
What are the slope and $y$ -intercept of the equation?	
Answer slope $-\frac{1}{4}$ , $y$ -intercept $-\frac{9}{4}$	


### Test 1—Question 3 Score Point 1

This response shows an incorrect equation. However, the student shows a correct slope and a correct  $y$ -intercept based on the incorrect equation. Therefore, this response receives a Score Point 1.

SCORE POINT 1	
<b>3</b>	On the line below, write the slope-intercept form of $4y + x = -9$ .
	Equation $y = \frac{1}{4}x - \frac{9}{4}$
What are the slope and $y$ -intercept of the equation?	
Answer slope $\frac{1}{4}$ , $y$ -intercept $-\frac{9}{4}$	

### Test 1—Question 3 Score Point 0

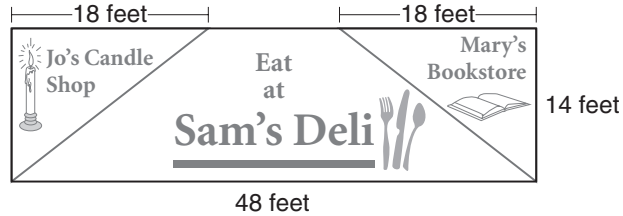
This response shows an incorrect equation. The student does not correctly convert the equation into slope-intercept form, which results in an incorrect slope and  $y$ -intercept. Therefore, this response receives a Score Point 0.

SCORE POINT 0	
<b>3</b>	On the line below, write the slope-intercept form of $4y + x = -9$ .
	Equation $4y = x + -9$ $y = mx + b$
What are the slope and $y$ -intercept of the equation?	
Answer slope $1$ , $y$ -intercept $-9$	

## Test 1—Question 4: Measurement

4

Sam's Deli shares advertising space on a rectangular billboard with two other stores. A diagram of the billboard is shown below.



What is the area of the billboard, in square feet, covered with Sam's advertisement?

**Show All Work**

**Answer** \_\_\_\_\_ square feet

### Exemplary Response:

- 420 square feet

Sample Process:

$$\begin{aligned} \bullet A &= \frac{1}{2}(b_1 + b_2)h \\ &= \frac{1}{2}(48 + 12)14 \\ &= 420 \text{ square feet} \end{aligned}$$

OR

- Other valid process

### Rubric:

<b>2 points</b>	Exemplary response
<b>1 point</b>	Correct complete process; error in computation
<b>0 points</b>	Other

**Test 1—Question 4**  
**Score Point 2**

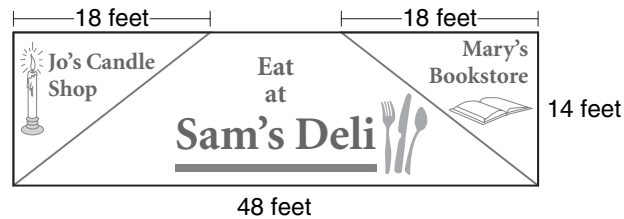
This response matches the exemplary response contained in the rubric. The student gives the correct answer of 420 square feet. The response receives a Score Point 2.

**SCORE POINT 2**

**4**



Sam's Deli shares advertising space on a rectangular billboard with two other stores. A diagram of the billboard is shown below.



What is the area of the billboard, in square feet, covered with Sam's advertisement?

**Show All Work**

$$A = \frac{1}{2} (48 + 12) \cdot 14$$

$$A = \frac{1}{2} (60) \cdot 14$$

$$A = 30 \cdot 14$$

$$\begin{array}{r} 14 \\ 48 \end{array}$$

$$\begin{array}{r} \times 30 \\ \hline 420 \end{array}$$

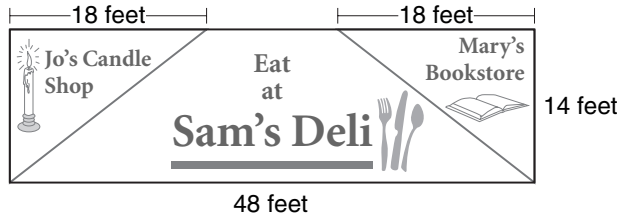
$$\begin{array}{r} 48 \\ - 36 \\ \hline 12 \end{array}$$

**Answer** 420 square feet

## SCORE POINT 1

4

Sam's Deli shares advertising space on a rectangular billboard with two other stores. A diagram of the billboard is shown below.



What is the area of the billboard, in square feet, covered with Sam's advertisement?

**Show All Work**

$$\begin{array}{r} 672 \\ - 252 \\ \hline 320 \text{ ft}^2 \end{array}$$

$$\begin{aligned} \text{rect: } 48(14) \\ A &= 672 \text{ ft}^2 \\ \text{tri: } \frac{1}{2}(18)(14) \\ \frac{1}{2}(252) \\ A &= 126 \text{ ft}^2 \text{ (for 1)} \\ &252 \text{ ft}^2 \text{ (for 2)} \end{aligned}$$

**Answer** 320 square feet

$$\begin{array}{r} \begin{array}{r} \overset{3}{48} \\ \cdot \overset{3}{14} \\ \hline \overset{1}{192} \\ \overset{480}{\phantom{1}00} \\ \hline \overset{672}{\phantom{1}00} \end{array} \quad \begin{array}{r} \overset{3}{18} \\ \cdot \overset{3}{14} \\ \hline \overset{1}{72} \\ \overset{180}{\phantom{1}00} \\ \hline \overset{252}{\phantom{1}00} \end{array} \quad \begin{array}{r} \overset{1}{126} \\ + \overset{1}{126} \\ \hline \overset{252}{\phantom{1}00} \end{array} \end{array}$$

## Test 1—Question 4 Score Point 1

This response shows a correct complete process. However, a computational error is made when the student subtracts 252 from 672, resulting in an incorrect answer of 320 square feet instead of 420 square feet. Therefore, this response receives a Score Point 1.

**Test 1—Question 4**  
**Score Point 0**

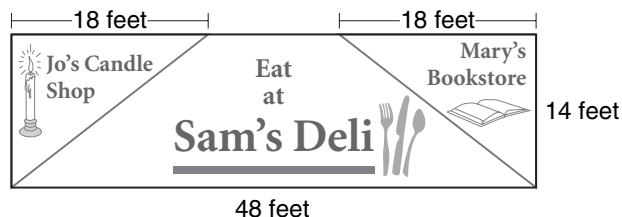
This response shows an incorrect answer and an incorrect process. Therefore, this response receives a Score Point 0.

**SCORE POINT 0**

**4**



Sam's Deli shares advertising space on a rectangular billboard with two other stores. A diagram of the billboard is shown below.



What is the area of the billboard, in square feet, covered with Sam's advertisement?

**Show All Work**

$$\begin{array}{r} 48 \\ \times 14 \\ \hline 192 \\ 480 \\ \hline 672 \end{array} \qquad \begin{array}{r} 336 \\ 2 \overline{)672} \end{array}$$

**Answer** 336 square feet

### Test 1—Question 5: Algebra and Functions

- 5** Lee and Dave are buying plants for landscaping. Lee bought 2 hostas ( $h$ ) and 3 marigolds ( $m$ ) for \$43.00. Dave bought 4 hostas and 5 marigolds for \$80.00.

On the lines below, write a system of equations that represents this information.

**Equations** \_\_\_\_\_

\_\_\_\_\_

Use this system of equations to determine the cost of 1 hosta and the cost of 1 marigold. Write the answers on the lines below.

**Show All Work**

**Hosta** \$ \_\_\_\_\_

**Marigold** \$ \_\_\_\_\_

**Exemplary Response:**

- $2h + 3m = 43.00$   
 $4h + 5m = 80.00$

OR

- Other valid equations

AND

- Hosta: \$12.50  
Marigold: \$6.00

Sample Process:

- $-2(2h + 3m = 43.00)$

$$\begin{array}{r} -4h - 6m = -86.00 \\ 4h + 5m = 80.00 \\ \hline -m = -6.00 \\ m = 6.00 \end{array}$$

$$2h + 3(6.00) = 43.00$$

$$2h = 25.00$$

$$h = 12.50$$

OR

- Other valid process

**Rubric:**

**3 points** Exemplary response

**2 points** Incorrect system solved correctly

OR

Correct system solved with a computational error

OR

Correct answer for hosta and marigold only

OR

Correct system of equations, but correct answers switched

**1 point** Incorrect system solved with computational error

OR

Correct system of equations

**0 points** Other



### SCORE POINT 3

- 5** Lee and Dave are buying plants for landscaping. Lee bought 2 hostas ( $h$ ) and 3 marigolds ( $m$ ) for \$43.00. Dave bought 4 hostas and 5 marigolds for \$80.00.

On the lines below, write a system of equations that represents this information.

Equations  $2h + 3m = 43$   
 $4h + 5m = 80$

Use this system of equations to determine the cost of 1 hosta and the cost of 1 marigold. Write the answers on the lines below.

**Show All Work**

$$\begin{array}{r} 4h + 5m = 80 \\ -5m \quad -5m \\ \hline 4h = 80 - 5m \\ h = 20 - \frac{5}{4}m \end{array}$$

Hosta \$ 12.50

Marigold \$ 6.00

$$\begin{array}{l} 2h + 3m = 43 \\ 2(12.5) + 3(6) = 43 \\ 25 + 18 = 43 \end{array}$$

$$\begin{array}{l} 2h + 3m = 43 \\ 2(20 - \frac{5}{4}m) + 3m = 43 \\ 40 - \frac{5}{2}m + 3m = 43 \\ -40 \quad -40 \\ 2 \times \frac{1}{2}m = 3 \times 2 \\ m = 6 \\ h = 20 - \frac{5}{4}m \\ h = 20 - (\frac{5}{4})(6) \\ h = 20 - \frac{15}{2} \\ h = 12\frac{1}{2} \end{array}$$

$$\begin{array}{l} \frac{1}{2} \times \frac{5}{4} = \frac{5}{2} \\ \frac{6}{2} \\ -\frac{5}{2} \\ \frac{1}{2} \\ \frac{5}{4} \times \frac{6}{1} = \frac{15}{2} \\ 19\frac{2}{2} \\ -7\frac{1}{2} \\ 12\frac{1}{2} \end{array}$$

### Test 1—Question 5 Score Point 3

This response matches the exemplary response contained in the rubric. The student shows the correct equations and the correct answers of \$12.50 for the cost of one hosta and \$6.00 for the cost of one marigold. The response receives a Score Point 3.

**Test 1—Question 5**  
**Score Point 2**

This response shows the correct equations. However, a computational error is made when the student subtracts 18 from 43, resulting in an incorrect answer of \$11.00 instead of \$12.50 for the cost of one hosta. Therefore, this response receives a Score Point 2.

**SCORE POINT 2**

- 5** Lee and Dave are buying plants for landscaping. Lee bought 2 hostas ( $h$ ) and 3 marigolds ( $m$ ) for \$43.00. Dave bought 4 hostas and 5 marigolds for \$80.00.

On the lines below, write a system of equations that represents this information.

Equations  $2h + 3m = 43$

$4h + 5m = 80$

Use this system of equations to determine the cost of 1 hosta and the cost of 1 marigold. Write the answers on the lines below.

**Show All Work**

$$-4h + -6m = -86$$

$$4h + 5m = 80$$

$$+ 1m = + 6$$

$$2h + 3(6) = 43$$

$$2h + 18 = 43$$

$$2h = 22$$

<sup>3</sup> 10

~~43~~

18

22

Hosta \$ 11.00

Marigold \$ 6.00

**SCORE POINT 1**

- 5** Lee and Dave are buying plants for landscaping. Lee bought 2 hostas ( $h$ ) and 3 marigolds ( $m$ ) for \$43.00. Dave bought 4 hostas and 5 marigolds for \$80.00.

On the lines below, write a system of equations that represents this information.

Equations  $2h + 3m = \$43.00$

$4h + 5m = \$80.00$

Use this system of equations to determine the cost of 1 hosta and the cost of 1 marigold. Write the answers on the lines below.

**Show All Work**

Hosta \$ \_\_\_\_\_

Marigold \$ \_\_\_\_\_

**Test 1—Question 5  
Score Point 1**

This response shows the correct equations only. Therefore, this response receives a Score Point 1.

**Test 1—Question 5**  
**Score Point 0**

This response shows incorrect equations, an incorrect process for solving the system of equations, and incorrect answers for the cost of one hosta and one marigold. Therefore, this response receives a Score Point 0.

**SCORE POINT 0**

- 5** Lee and Dave are buying plants for landscaping. Lee bought 2 hostas ( $h$ ) and 3 marigolds ( $m$ ) for \$43.00. Dave bought 4 hostas and 5 marigolds for \$80.00.

On the lines below, write a system of equations that represents this information.

Equations  $2x + 3x = \$43.00$

$4x + 5x = \$80.00$

Use this system of equations to determine the cost of 1 hosta and the cost of 1 marigold. Write the answers on the lines below.

**Show All Work**

$$\begin{array}{r}
 80 \\
 5 \overline{)43} \quad \underline{43} \\
 123
 \end{array}
 \qquad
 \begin{array}{r}
 810 \\
 14 \overline{)123} \quad \underline{112} \\
 11 \\
 14 \\
 8 \\
 0
 \end{array}
 \qquad
 \begin{array}{r}
 14 \\
 9 \\
 \hline
 14 \\
 8 \\
 \hline
 112 \\
 14 \\
 2 \\
 \hline
 28
 \end{array}
 \qquad
 \begin{array}{r}
 20 \\
 6 \overline{)123} \quad \underline{12} \\
 3 \\
 161 \\
 8 \overline{)123} \quad \underline{8} \\
 53 \\
 40 \\
 13 \\
 8 \\
 \hline
 5
 \end{array}
 \qquad
 \begin{array}{r}
 1 \\
 16 \\
 8 \\
 1 \\
 24 \\
 8 \\
 \hline
 32
 \end{array}$$

Hosta \$ 20.00

Marigold \$ 16.10

## Test 1—Question 6: Algebra and Functions

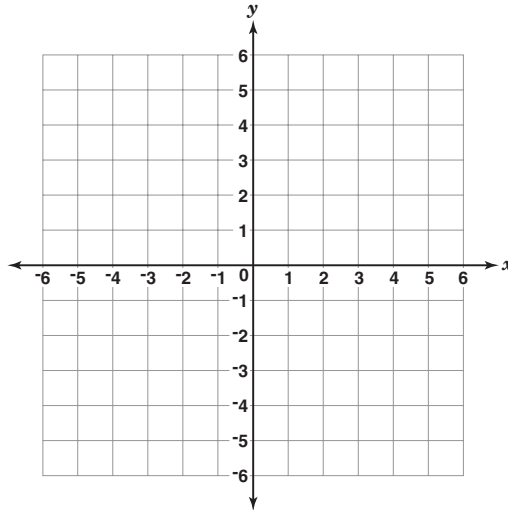
6



Use your ruler as a straightedge.

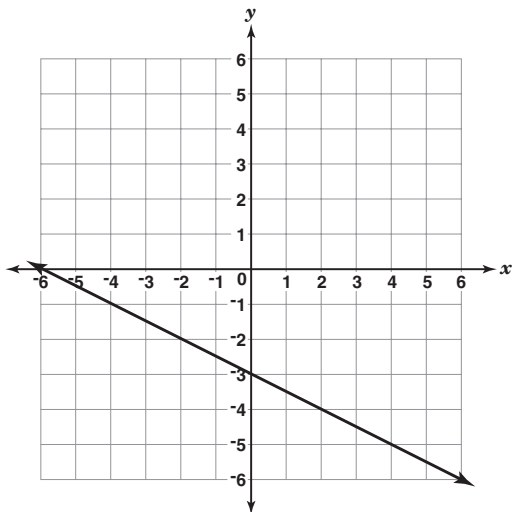


Graph the equation  $y = -\frac{1}{2}x - 3$  on the coordinate plane below.



### Exemplary Response:

•



**NOTES:** If more than one line is drawn, a score of 0 points will be awarded.

If an incorrect point is plotted with no line drawn, a score of 0 points will be awarded.

### Rubric:

<b>2 points</b>	Exemplary response
<b>1 point</b>	Correct slope of $-\frac{1}{2}$ with line drawn OR Correct x-intercept of $-6$ or y-intercept of $-3$ with line drawn OR No line drawn, at least 2 points plotted that would fall on the correct line, and no incorrect points plotted
<b>0 points</b>	Other

**Test 1—Question 6**  
**Score Point 2**

This response matches the exemplary response contained in the rubric. The student shows the correct graph of the equation with a slope of  $-\frac{1}{2}$ , passing through the correct  $y$ -intercept of  $-3$ . The response receives a Score Point 2.

**SCORE POINT 2**

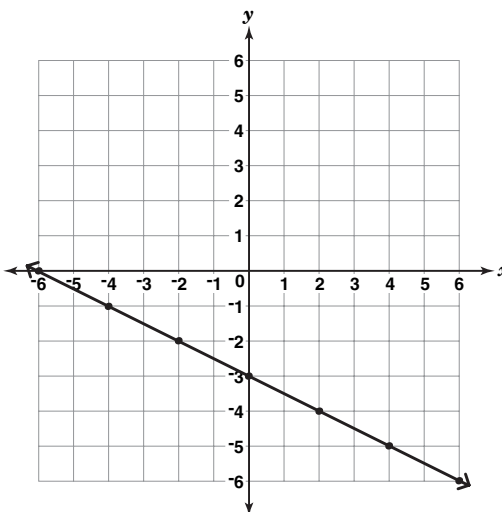
**6**



Use your ruler as a straightedge.



Graph the equation  $y = -\frac{1}{2}x - 3$  on the coordinate plane below.



### SCORE POINT 1

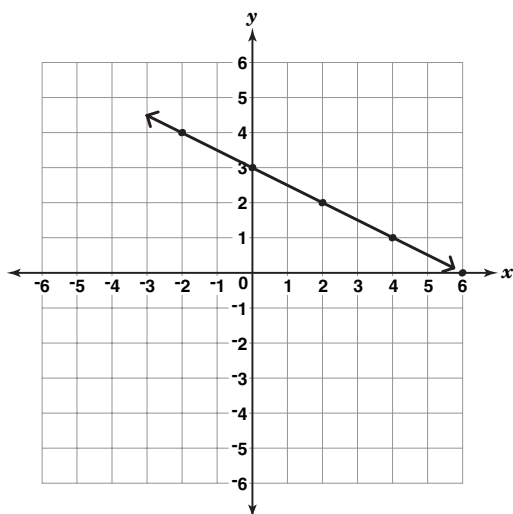
6



Use your ruler as a straightedge.



Graph the equation  $y = -\frac{1}{2}x - 3$  on the coordinate plane below.



### Test 1—Question 6 Score Point 1

This response shows a graph with the correct slope of  $-\frac{1}{2}$ , but it does not pass through the correct y-intercept. Therefore, this response receives a Score Point 1.

**Test 1—Question 6**  
**Score Point 0**

This response shows a graph with an incorrect slope and incorrect  $x$ - and  $y$ -intercepts. Therefore, this response receives a Score Point 0.

**SCORE POINT 0**

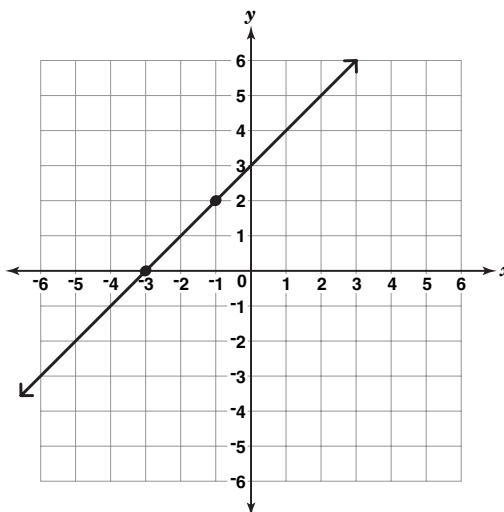
**6**



Use your ruler as a straightedge.



Graph the equation  $y = -\frac{1}{2}x - 3$  on the coordinate plane below.





## Test 1—Question 7: Algebra and Functions

- 7** Jenni is having her book printed. A printing company charges \$7.50 per copy, plus a one-time fee of \$125.00 to do the work.

On the line below, write an equation that can be used to determine the total cost,  $y$ , to print  $x$  copies of the book.

Equation \_\_\_\_\_

Now use the equation you wrote to determine how many copies of the book Jenni can have printed for \$800.

Answer \_\_\_\_\_ copies

### Exemplary Response:

- $y = 7.5x + 125$

OR

- Other valid equation

AND

- 90 copies

### Rubric:

**2 points** Exemplary response

**1 point** One correct component

OR

Correct answer based on an incorrect equation

**0 points** Other

### Test 1—Question 7 Score Point 2

This response matches the exemplary response contained in the rubric. The student shows a correct equation and the correct answer of 90 copies. The response receives a Score Point 2.

SCORE POINT 2	
<b>7</b>	<p>Jenni is having her book printed. A printing company charges \$7.50 per copy, plus a one-time fee of \$125.00 to do the work.</p> <p>On the line below, write an equation that can be used to determine the total cost, <math>y</math>, to print <math>x</math> copies of the book.</p> <p><b>Equation</b> <u><math>y = \\$7.50x + \\$125</math></u></p> <p>Now use the equation you wrote to determine how many copies of the book Jenni can have printed for \$800.</p> <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 45%;"> <p><b>Answer</b> <u>90</u> copies</p> </div> <div style="width: 50%; text-align: right;"> <math display="block">  \begin{array}{r}  800 = 7.50x + 125 \\  - 125 \qquad \qquad - 125 \\  \hline  675 = 7.5x \\  \frac{675}{7.5} = \frac{7.5x}{7.5} \\  x = 90  \end{array}  </math> </div> </div>

### Test 1—Question 7 Score Point 1

This response shows the correct equation. However, the student shows an incorrect answer of 9 copies instead of 90 copies. Therefore, this response receives a Score Point 1.

SCORE POINT 1	
<b>7</b>	<p>Jenni is having her book printed. A printing company charges \$7.50 per copy, plus a one-time fee of \$125.00 to do the work.</p> <p>On the line below, write an equation that can be used to determine the total cost, <math>y</math>, to print <math>x</math> copies of the book.</p> <p><b>Equation</b> <u><math>y = 7.5x + 125</math></u></p> <p>Now use the equation you wrote to determine how many copies of the book Jenni can have printed for \$800.</p> <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 45%;"> <p><b>Answer</b> <u>9</u> copies</p> </div> <div style="width: 50%; text-align: right;"> <math display="block">  \begin{array}{r}  800 \\  - 125 \\  \hline  675 \\  \frac{675}{7.5} = 9  \end{array}  </math> </div> </div>

**SCORE POINT 0**

- 7** Jenni is having her book printed. A printing company charges \$7.50 per copy, plus a one-time fee of \$125.00 to do the work.

On the line below, write an equation that can be used to determine the total cost,  $y$ , to print  $x$  copies of the book.

**Equation**            $y = 7.50 \times 125x$           

Now use the equation you wrote to determine how many copies of the book Jenni can have printed for \$800.

**Answer**           12           copies

**Test 1—Question 7  
Score Point 0**

This response shows an incorrect equation and an incorrect answer. Therefore, this response receives a Score Point 0.

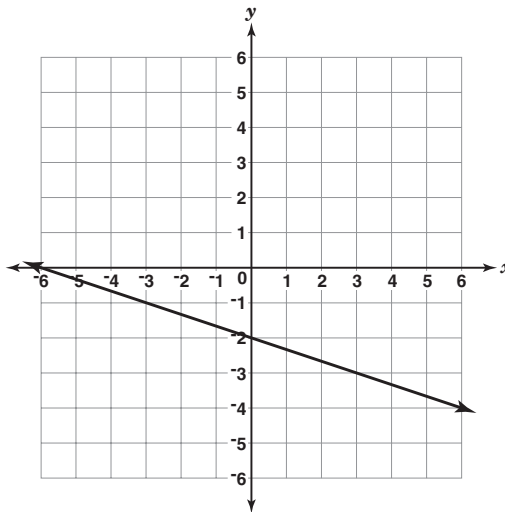
### Test 1—Question 8: Problem Solving

8



A machine at a machine shop is set to cut along the path shown on the coordinate plane below. Terry must change the path by rotating the original path  $90^\circ$  counterclockwise about the origin.

On the coordinate plane below, draw the NEW path the machine is set to cut.



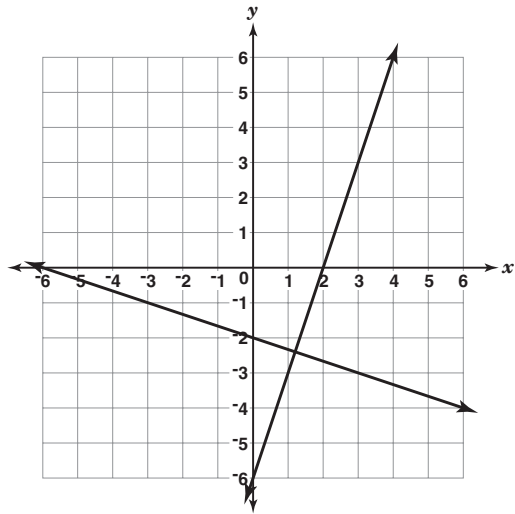
To start the machine Terry must enter the equation of the new line into the machine.

Write an equation of the line that represents the new path the machine will cut.

Equation \_\_\_\_\_

### Exemplary Response:

•



AND

•  $y = 3x - 6$

OR

• Other valid equation

**NOTE:** Award 1 point for a correct equation based on an incorrect line.

### Rubric:

**2 points** Exemplary response

**1 point** One correct component

**0 points** Other

## Test 1—Question 8

### Score Point 2

This response matches the exemplary response contained in the rubric. The student shows the correct graph of the line rotated  $90^\circ$  counterclockwise and a correct equation. The response receives a Score Point 2.

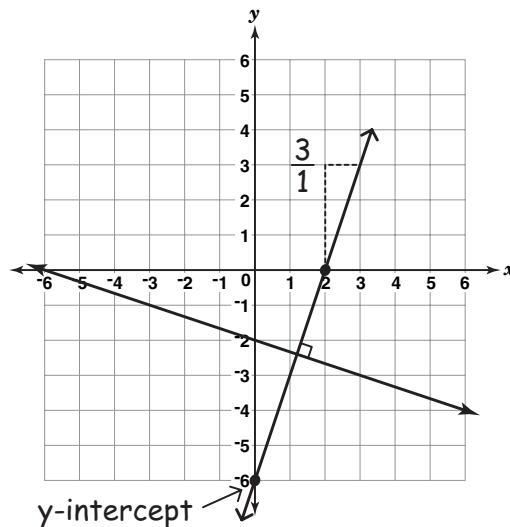
### SCORE POINT 2

8



A machine at a machine shop is set to cut along the path shown on the coordinate plane below. Terry must change the path by rotating the original path  $90^\circ$  counterclockwise about the origin.

On the coordinate plane below, draw the NEW path the machine is set to cut.



To start the machine Terry must enter the equation of the new line into the machine.

Write an equation of the line that represents the new path the machine will cut.

Equation  $y = 3x - 6$

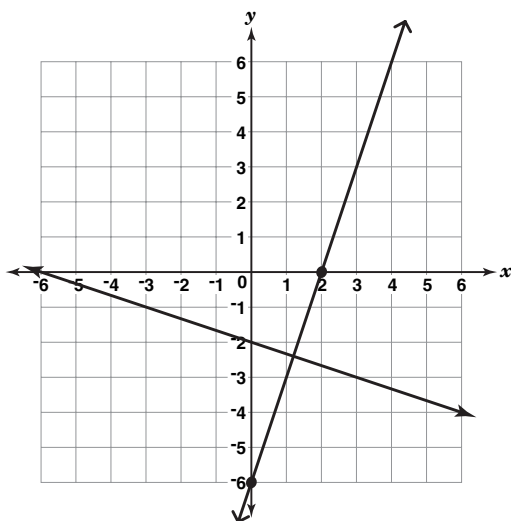
## SCORE POINT 1

8



A machine at a machine shop is set to cut along the path shown on the coordinate plane below. Terry must change the path by rotating the original path  $90^\circ$  counterclockwise about the origin.

On the coordinate plane below, draw the NEW path the machine is set to cut.



To start the machine Terry must enter the equation of the new line into the machine.

Write an equation of the line that represents the new path the machine will cut.

Equation  $y = 3x + 6$

## Test 1—Question 8 Score Point 1

This response shows a correct graph of the line rotated  $90^\circ$  counterclockwise. However, an incorrect equation is written on the answer line. Therefore, this response receives a Score Point 1.

**Test 1—Question 8**  
**Score Point 0**

This response shows an incorrect graph and an incorrect equation. Therefore, this response receives a Score Point 0.

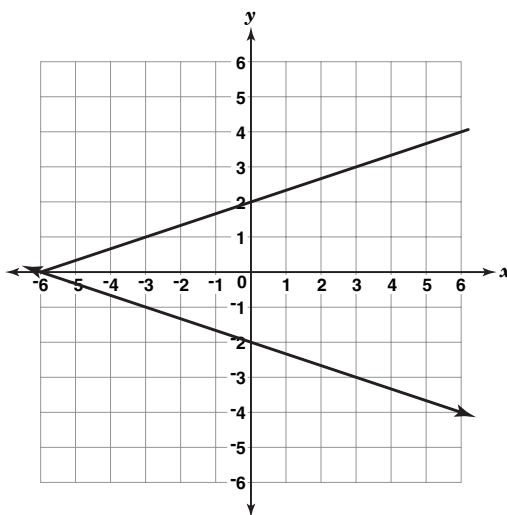
**SCORE POINT 0**

**8**



A machine at a machine shop is set to cut along the path shown on the coordinate plane below. Terry must change the path by rotating the original path  $90^\circ$  counterclockwise about the origin.

On the coordinate plane below, draw the NEW path the machine is set to cut.



To start the machine Terry must enter the equation of the new line into the machine.

Write an equation of the line that represents the new path the machine will cut.

Equation  $y = 2/3x + 2$

$$\begin{array}{r} 0,2 \quad 33 \\ 3 - 2 \quad \frac{2}{3} \\ 3-0 \end{array}$$

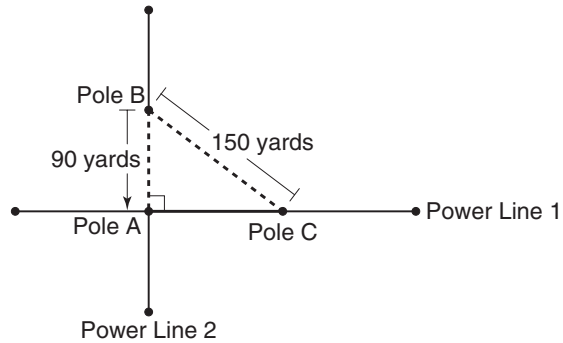


## Test 2—Question 1: Geometry

1



A land surveyor wants to know the distance between pole A and pole C in the diagram below.



The surveyor knows that power line 1 is perpendicular to power line 2. What is the distance, in yards, between pole A and pole C? Write your answer on the line below.

**Show All Work**

**Answer** \_\_\_\_\_ yards

**Exemplary Response:**

- 120 yards

Sample Process:

- The segments that connect poles A, B, and C form a right triangle.

$$a^2 + b^2 = c^2$$

$$(90)^2 + b^2 = (150)^2$$

$$8,100 + b^2 = 22,500$$

$$b^2 = 14,400$$

$$b = \sqrt{14,400} = 120 \text{ yards}$$

OR

- Other valid process

**Rubric:**

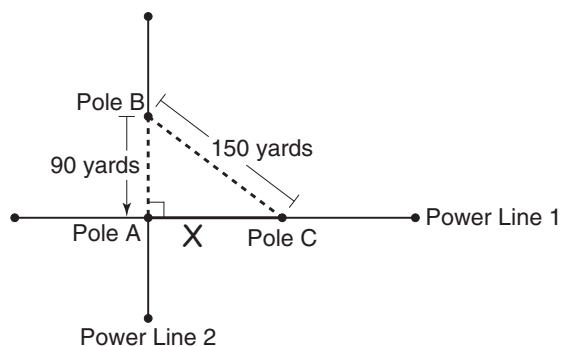
<b>2 points</b>	Exemplary response
<b>1 point</b>	Correct complete process; error in computation
<b>0 points</b>	Other

## SCORE POINT 2

1



A land surveyor wants to know the distance between pole A and pole C in the diagram below.



The surveyor knows that power line 1 is perpendicular to power line 2. What is the distance, in yards, between pole A and pole C? Write your answer on the line below.

**Show All Work**

$$\begin{aligned}90^2 + x^2 &= 150^2 \\8100 + x^2 &= 22500 \\x^2 &= 14400 \\x &= 120\end{aligned}$$

**Answer** 120 yards

## Test 2—Question 1 Score Point 2

This response matches the exemplary response contained in the rubric. The student shows the correct answer of 120 yards. The response receives a Score Point 2.

## Test 2—Question 1

### Score Point 1

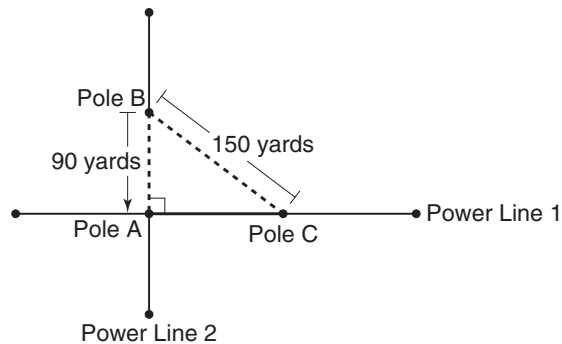
This response shows a correct complete process. However, a computational error is made when the student incorrectly finds the square root of 14,400, resulting in an incorrect answer of 12 yards instead of 120 yards. Therefore, this response receives a Score Point 1.

### SCORE POINT 1

1



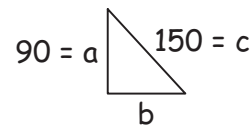
A land surveyor wants to know the distance between pole A and pole C in the diagram below.



The surveyor knows that power line 1 is perpendicular to power line 2. What is the distance, in yards, between pole A and pole C? Write your answer on the line below.

#### Show All Work

$$\begin{aligned} 90^2 + b^2 &= 150^2 \\ 8100 + b^2 &= 22500 \\ \sqrt{b^2} &= \sqrt{14400} \\ b &= 12 \end{aligned}$$

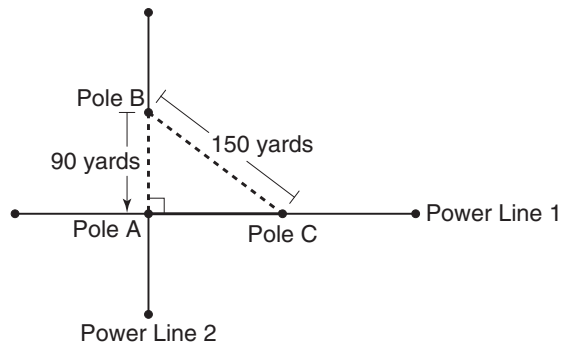


Answer 12 yards

### SCORE POINT 0

1

A land surveyor wants to know the distance between pole A and pole C in the diagram below.



The surveyor knows that power line 1 is perpendicular to power line 2. What is the distance, in yards, between pole A and pole C? Write your answer on the line below.

**Show All Work**

$$a^2 + b^2 = c^2$$

$$90^2 + 150^2 =$$

$$8100 + 22500 = c^2$$

$$30600 = c^2$$

**Answer** 15,300 yards

### Test 2—Question 1 Score Point 0

This response shows an incorrect answer and an incorrect process. Therefore, this response receives a Score Point 0.

## Test 2—Question 2: Algebra and Functions

- 2** Daniel collects \$87.00 by selling paperback books for \$0.50 each and hardcover books for \$4.00 each.
- Let  $p$  be the number of paperback books he sells and  $h$  be the number of hardcover books he sells.

Write an equation to represent this situation.

Equation \_\_\_\_\_

If Daniel sells 62 paperback books, how many hardcover books does he sell?

Answer \_\_\_\_\_ hardcover books

### Exemplary Response:

- $0.5p + 4h = 87$

OR

- Other valid equation

AND

- 14 hardcover books

**NOTE:** Award 1 point for a correct answer based on an incorrect equation.

### Rubric:

**2 points** Exemplary response

**1 point** One correct component

**0 points** Other

### SCORE POINT 2

- 2** Daniel collects \$87.00 by selling paperback books for \$0.50 each and hardcover books for \$4.00 each.

Let  $p$  be the number of paperback books he sells and  $h$  be the number of hardcover books he sells.

Write an equation to represent this situation.

Equation  $87 = .5p + 4h$

If Daniel sells 62 paperback books, how many hardcover books does he sell?

$$\begin{array}{r} 87 = .5 \cdot 62 + 4h \\ 87 = 31 + 4h \\ \underline{56 = 4h} \\ 4 \end{array}$$

Answer 14 hardcover books

### Test 2—Question 2 Score Point 2

This response matches the exemplary response contained in the rubric. The student shows a correct equation and the correct answer of 14 hardcover books. The response receives a Score Point 2.

### SCORE POINT 1

- 2** Daniel collects \$87.00 by selling paperback books for \$0.50 each and hardcover books for \$4.00 each.

Let  $p$  be the number of paperback books he sells and  $h$  be the number of hardcover books he sells.

Write an equation to represent this situation.

Equation  $p + h = \$87.00$

If Daniel sells 62 paperback books, how many hardcover books does he sell?

$$\begin{array}{r} 14 \\ 4 \overline{)56} \\ \underline{-4} \\ 16 \end{array}$$

Answer 14 hardcover books

### Test 2—Question 2 Score Point 1

This response shows an incorrect equation. However, the student shows the correct answer of 14 hardcover books. Therefore, this response receives a Score Point 1.

**Test 2—Question 2**  
**Score Point 0**

This response shows an incorrect equation and an incorrect answer. Therefore, this response receives a Score Point 0.

**SCORE POINT 0**

**2** Daniel collects \$87.00 by selling paperback books for \$0.50 each and hardcover books for \$4.00 each.

Let  $p$  be the number of paperback books he sells and  $h$  be the number of hardcover books he sells.

Write an equation to represent this situation.

Equation          $62p + 24h = 87$         

If Daniel sells 62 paperback books, how many hardcover books does he sell?

Answer         24         hardcover books



## Test 2—Question 3: Problem Solving

**3**



Kramer's Cereal Company has been receiving complaints because a cereal box the company makes is too tall for many shelves. The size of the box is 18 inches high, 7.75 inches long, and 2.5 inches wide.

Mr. Kramer decides to keep the same volume and length, but reduce the height of the cereal box by 25%.

What will be the width, in inches, of the new cereal box? Round your answer to the nearest hundredth of an inch.

**Show All Work**

**Answer** \_\_\_\_\_ inches

### Exemplary Response:

- 3.33 inches

AND

- Correct complete process

Sample Process:

$$\begin{aligned} V &= 18 \times 7.75 \times 2.5 \\ &= 348.75 \end{aligned}$$

$$\begin{aligned} \text{Height of new cereal box} \\ &= 0.75 \times 18 \\ &= 13.5 \end{aligned}$$

Let  $w$  represent the width

$$\begin{aligned} 13.5 \times 7.75 \times w &= 348.75 \\ 104.625w &= 348.75 \\ w &\approx 3.33 \end{aligned}$$

OR

- Other valid process

### Rubric:

**3 points** Exemplary response

**2 points** Correct answer only  
OR

Correct complete process; error in computation

**1 point** Correct process for determining the volume of the original cereal box  
OR


Correct process for determining the height of the new cereal box

**0 points** Other

### Test 2—Question 3 Score Point 3

This response matches the exemplary response contained in the rubric. The student shows a correct complete process and the correct answer of 3.33 inches. The response receives a Score Point 3.

**SCORE POINT 3**

**3**  Kramer's Cereal Company has been receiving complaints because a cereal box the company makes is too tall for many shelves. The size of the box is 18 inches high, 7.75 inches long, and 2.5 inches wide.

Mr. Kramer decides to keep the same volume and length, but reduce the height of the cereal box by 25%.

What will be the width, in inches, of the new cereal box? Round your answer to the nearest hundredth of an inch.

**Show All Work**

$$\begin{array}{r} 18 \\ - 4.5 \\ \hline 13.5 \text{ in} \end{array}$$

$$\begin{array}{r} 18 \\ \times .25 \\ \hline 4.5 \end{array}$$

$$\begin{aligned} V &= 18(7.75)(2.5) \\ &= 139.5(2.5) \\ V &= 348.75 \end{aligned}$$


$$\begin{aligned} 348.75 &= (13.5)(w)(7.75) \\ &= 104.625w \\ 3.33 &= w \end{aligned}$$

**Answer** 3.33 inches

### Test 2—Question 3 Score Point 2

This response shows a correct complete process. However, a computational error is made when the student divides 45 by 13.5, resulting in an incorrect answer of 3.34 inches instead of 3.33 inches. Therefore, this response receives a Score Point 2.

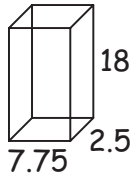
**SCORE POINT 2**

**3**  Kramer's Cereal Company has been receiving complaints because a cereal box the company makes is too tall for many shelves. The size of the box is 18 inches high, 7.75 inches long, and 2.5 inches wide.

Mr. Kramer decides to keep the same volume and length, but reduce the height of the cereal box by 25%.

What will be the width, in inches, of the new cereal box? Round your answer to the nearest hundredth of an inch.

**Show All Work**

$$\begin{array}{r} 4.5 \\ 18 \end{array} \quad \begin{array}{r} 25 \\ 100 \end{array}$$


$$\begin{aligned} V &= 18 \times 7.75 \times 2.5 \\ V &= 348.75 \end{aligned}$$

new height = 13.5

$$13.5 \times \frac{7.75}{7.75} \times \underline{\quad} = \frac{348.75}{7.75}$$

$$\frac{13.5}{13.5} \times \underline{\quad} = \frac{45}{13.5} \quad \text{width} = 3.34$$

**Answer** 3.34 inches

### SCORE POINT 1

3



Kramer's Cereal Company has been receiving complaints because a cereal box the company makes is too tall for many shelves. The size of the box is 18 inches high, 7.75 inches long, and 2.5 inches wide.

Mr. Kramer decides to keep the same volume and length, but reduce the height of the cereal box by 25%.

What will be the width, in inches, of the new cereal box? Round your answer to the nearest hundredth of an inch.

Show All Work

$$\begin{array}{r} 18 \\ .25 \\ \hline 4.5 \end{array} \quad \begin{array}{r} 18 \\ -4.5 \\ \hline 13.5 \end{array} \leftarrow \text{new height}$$

$$\begin{array}{r} \text{width} \\ 2.5 \\ \hline 252.5 \\ 0.625 \\ \hline 1.875 \\ 1.88 \end{array}$$

Answer 1.88 inches

### Test 2—Question 3 Score Point 1

This response shows an incorrect answer and an incomplete process. However, the student shows a correct process for determining the height of the new cereal box. Therefore, this response receives a Score Point 1.

### SCORE POINT 0

3



Kramer's Cereal Company has been receiving complaints because a cereal box the company makes is too tall for many shelves. The size of the box is 18 inches high, 7.75 inches long, and 2.5 inches wide.

Mr. Kramer decides to keep the same volume and length, but reduce the height of the cereal box by 25%.

What will be the width, in inches, of the new cereal box? Round your answer to the nearest hundredth of an inch.

Show All Work

18 in. high   7.75 long   2.5 in wide

$$18 \text{ in} \div 25\%$$

$$18 \div 2 = 9$$

Answer 14 inches

### Test 2—Question 3 Score Point 0

This response shows an incorrect answer and an incorrect process. Therefore, this response receives a Score Point 0.

## Test 2—Question 4: Problem Solving

4



Jeff's airplane flight was 2,530 kilometers long. The total travel time was 7 hours and 10 minutes, which included a 1 hour and 25 minute stop at an airport.

What was the average speed, in KILOMETERS PER HOUR, of the airplane while it was in the air?

**Show All Work**

Answer \_\_\_\_\_ kilometers per hour

### Exemplary Response:

- 440 kilometers per hour
- AND
- Correct complete process

Sample Process:

- 7 hours and 10 minutes = 430 minutes

1 hour and 25 minutes = 85 minutes

$430 - 85 = 345$  minutes

Convert minutes to hours:

$$\frac{345}{60} = 5.75 \text{ hours}$$

Speed of jet:

$$d = rt$$

$$2,530 = r(5.75)$$

$$r = 440 \text{ kilometers per hour}$$

OR

- Other valid process

### Rubric:

- |                 |  |
|-----------------|--|
| <b>3 points</b> | Exemplary response                               |
| <b>2 points</b> | Correct answer only                              |
|                 | OR   |
|                 | Correct complete process; error in computation   |
| <b>1 point</b>  | Correct process for determining length of flight |
| <b>0 points</b> | Other  |

### SCORE POINT 3

4



Jeff's airplane flight was 2,530 kilometers long. The total travel time was 7 hours and 10 minutes, which included a 1 hour and 25 minute stop at an airport.

What was the average speed, in KILOMETERS PER HOUR, of the airplane while it was in the air?

**Show All Work**

$$\begin{array}{r} 7:10 \\ - 1:25 \\ \hline 5:45 \text{ - plane ride} \end{array}$$

$$\begin{array}{l} d = rt \\ \frac{2530}{5.75} = \frac{r(5.75)}{5.75} \\ r = 440 \end{array}$$

$$\begin{array}{l} \checkmark \\ d = rt \\ d = 440(5.75) \end{array}$$

**Answer** 440 kilometers per hour

### Test 2—Question 4 Score Point 3

This response matches the exemplary response contained in the rubric. The student shows the correct answer of 440 kilometers per hour and a correct complete process. The response receives a Score Point 3.

### SCORE POINT 2

4



Jeff's airplane flight was 2,530 kilometers long. The total travel time was 7 hours and 10 minutes, which included a 1 hour and 25 minute stop at an airport.

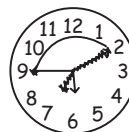
What was the average speed, in KILOMETERS PER HOUR, of the airplane while it was in the air?

**Show All Work**

Flight = 2,530 km long

$$\begin{array}{r} 374.81481 \\ 6.75 \overline{)2530} \\ \underline{375} \end{array}$$

$$\begin{array}{r} 7 \text{ hrs } 10 \text{ min} \\ - 1 \text{ hr. } 25 \text{ min} \\ \hline 6 \text{ hrs. } 45 \text{ min} \\ \hline 405 \text{ min} \\ \hline 6 \text{ hr. } 45 \text{ min} \end{array}$$



**Answer** 375 kilometers per hour

### Test 2—Question 4 Score Point 2

This response shows a correct complete process. However, a computational error is made when the student subtracts 1 hour and 25 minutes from 7 hours and 10 minutes, resulting in an incorrect answer of 375 kilometers per hour instead of 440 kilometers per hour. Therefore, this response receives a Score Point 2.

### Test 2—Question 4 Score Point 1

This response shows an incorrect answer and an incomplete process. However, the student shows a correct process for determining the length of the flight. Therefore, this response receives a Score Point 1.

SCORE POINT 1	
<b>4</b>	<p>Jeff's airplane flight was 2,530 kilometers long. The total travel time was 7 hours and 10 minutes, which included a 1 hour and 25 minute stop at an airport.</p> <p> What was the average speed, in KILOMETERS PER HOUR, of the airplane while it was in the air?</p> <p style="text-align: center;"><b>Show All Work</b></p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <math display="block">60 + 25 = 85</math> <math display="block">\frac{515}{2530} = \frac{345}{x}</math> </div> <div style="text-align: center;"> <math display="block">\begin{array}{r} 60 \\ \times 7 \\ \hline 420 \end{array} + 10 = 430 \text{ min.}</math> <math display="block">\begin{array}{r} 430 \text{ min.} \\ - 85 \text{ min.} \\ \hline 345 \end{array}</math> </div> <p style="text-align: center;"><b>Answer</b> <u>345</u> kilometers per hour</p> </div>

### Test 2—Question 4 Score Point 0

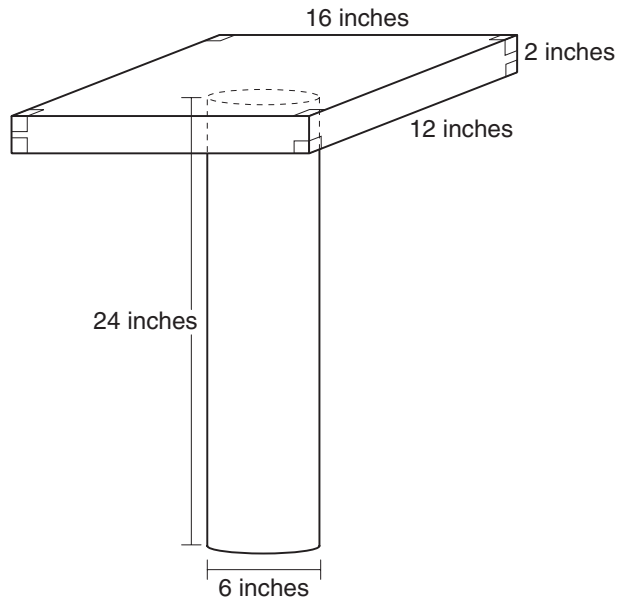
This response shows an incorrect answer and an incorrect process. Therefore, this response receives a Score Point 0.

SCORE POINT 0	
<b>4</b>	<p>Jeff's airplane flight was 2,530 kilometers long. The total travel time was 7 hours and 10 minutes, which included a 1 hour and 25 minute stop at an airport.</p> <p> What was the average speed, in KILOMETERS PER HOUR, of the airplane while it was in the air?</p> <p style="text-align: center;"><b>Show All Work</b></p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <math display="block">d = rt</math> <math display="block">2,530 = 430r - 85</math> <math display="block">2,615 = 430r</math> <math display="block">6.1 = r</math> </div> <div style="text-align: center;"> <math display="block">\frac{6.1}{1} = \frac{x}{60}</math> <math display="block">x = 366</math> </div> </div> <p style="text-align: center;"><b>Answer</b> <u>366</u> kilometers per hour</p>

## Test 2—Question 5: Measurement

5

A cement plant stand in the shape of a rectangular prism on top of a cylinder is shown in the diagram below.



What is the volume, in cubic inches, of the plant stand?

**Show All Work**

**Answer** \_\_\_\_\_ cubic inches

**Exemplary Response:**

- 1,062.24 cubic inches

Sample Process:

- Volume of prism =  $12 \times 16 \times 2 = 384$

$$\begin{aligned}\text{Volume of cylinder} &= 3.14 \times 3^2 \times 24 \\ &= 678.24\end{aligned}$$

$$\text{Total volume} = 384 + 678.24 = 1,062.24$$

OR

- Other valid process

**Rubric:**

**2 points** Exemplary response

**1 point** Correct complete process; error in computation

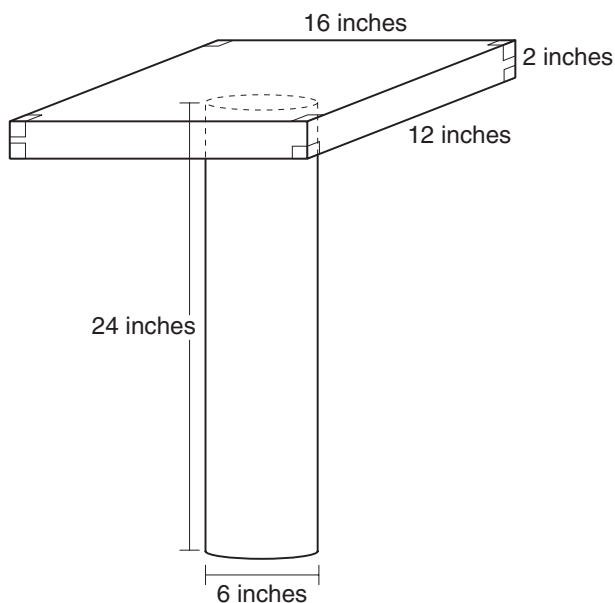
**0 points** Other



## SCORE POINT 2

5

A cement plant stand in the shape of a rectangular prism on top of a cylinder is shown in the diagram below.



What is the volume, in cubic inches, of the plant stand?

**Show All Work**

$$16 \times 12 \times 2 = 384 \text{ in.}^3 = \text{top}$$

$$2\overline{)6}^3$$

$$3^2 \times \pi =$$

$$9 \times 3.14 = 28.26$$

$$\begin{array}{r} 28.26 \\ \times 24 \\ \hline 678.24 \end{array}$$

$$\begin{array}{r} 678.24 \\ + 384.00 \\ \hline \end{array}$$

**Answer** 1062.24 cubic inches

## Test 2—Question 5 Score Point 2

This response matches the exemplary response contained in the rubric. The student shows the correct answer of 1,062.24 cubic inches. The response receives a Score Point 2.

**Test 2—Question 5**  
**Score Point 1**

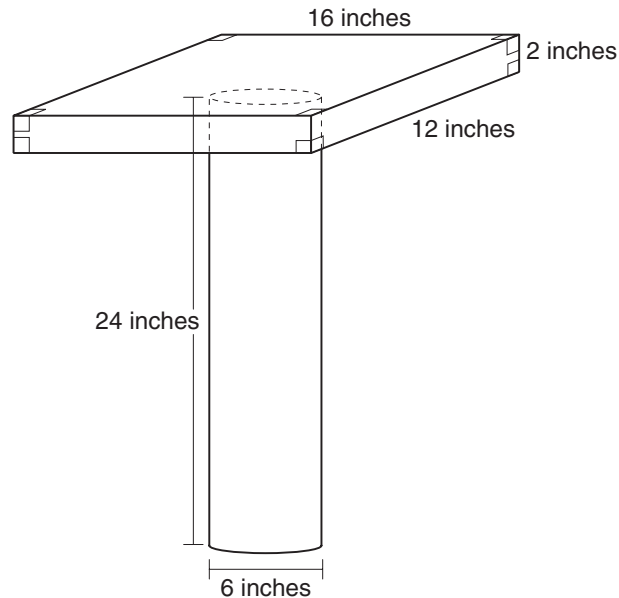
This response shows a correct complete process. However, a computational error is made when the student adds 384 to 678.24, resulting in an incorrect answer of 1,356.48 cubic inches instead of 1,062.24 cubic inches. Therefore, this response receives a Score Point 1.

**SCORE POINT 1**

**5**



A cement plant stand in the shape of a rectangular prism on top of a cylinder is shown in the diagram below.



What is the volume, in cubic inches, of the plant stand?

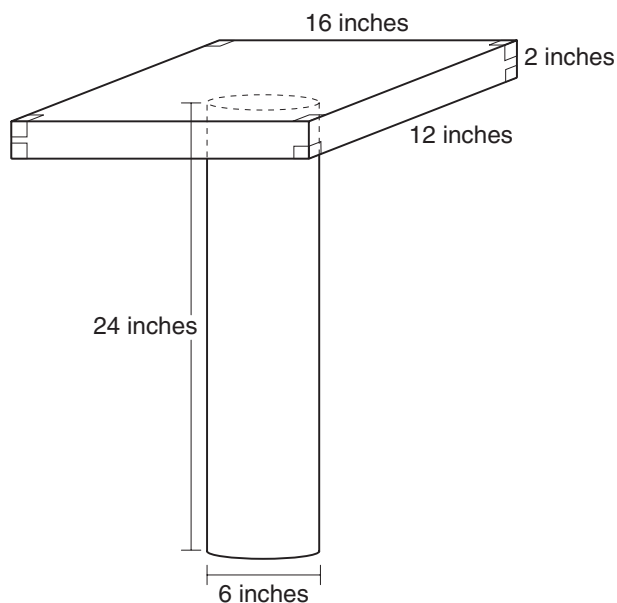
**Show All Work**

$$\begin{array}{rcl} 16 \cdot 2 \cdot 12 & = & 384 \\ \pi \cdot 3^2 \cdot 24 & = & 678.24 \end{array} \qquad \begin{array}{r} 678.24 \\ + 384 \\ \hline \end{array}$$

**Answer** 1356.48 cubic inches

**SCORE POINT 0****5**

A cement plant stand in the shape of a rectangular prism on top of a cylinder is shown in the diagram below.



What is the volume, in cubic inches, of the plant stand?

**Show All Work**

$$\begin{aligned}\text{rect} - V &= lwh + \text{cyl} - V = \pi r^2 h \\ (16 \cdot 12 \cdot 2) &+ (\pi 3^2 \cdot 24) \\ 384 &+ 28.27 \\ 412.27\end{aligned}$$

**Answer** 412.27 cubic inches

**Test 2—Question 5  
Score Point 0**

This response shows an incorrect answer and an incorrect process. Therefore, this response receives a Score Point 0.

## Test 2—Question 6: Problem Solving

**6**



The fastest whale can swim  $1.878 \times 10^6$  centimeters in 20 minutes. The fastest dolphin can swim  $1.502 \times 10^6$  centimeters in 20 minutes.

At these speeds, how many more METERS can the fastest whale swim than the fastest dolphin in 1 hour and 15 minutes?

**Show All Work**

Answer \_\_\_\_\_ meters

### Exemplary Response:

- $1.41 \times 10^4$  meters

OR

- 14,100 meters

AND

- Correct complete process

Sample Process:

- $1.878 \times 10^6$  centimeters in 20 minutes  
=  $1.878 \times 10^4$  meters in 20 minutes  
 $1.502 \times 10^6$  centimeters in 20 minutes  
=  $1.502 \times 10^4$  meters in 20 minutes  
 $1.878 \times 10^4 - 1.502 \times 10^4$   
=  $0.376 \times 10^4 = 3.76 \times 10^3$   
1 hour 15 minutes = 75 minutes  
 $3.76 \times 10^3 \times 75 \div 20 = 14.1 \times 10^3$   
=  $1.41 \times 10^4$

OR

- Other valid process

### Rubric:

**3 points** Exemplary response

**2 points** Correct answer only  
OR

Correct process for determining the distances the whale and dolphin travel in 75 minutes

**1 point** Correct process for converting the distances the whale and dolphin travel from centimeters to meters

**0 points** Other

### SCORE POINT 3

6

The fastest whale can swim  $1.878 \times 10^6$  centimeters in 20 minutes. The fastest dolphin can swim  $1.502 \times 10^6$  centimeters in 20 minutes.

At these speeds, how many more METERS can the fastest whale swim than the fastest dolphin in 1 hour and 15 minutes?

Show All Work

$$\frac{1,878,000 \text{ cm}}{20 \text{ min}} \times \frac{1 \text{ m}}{100 \text{ cm}} = \frac{18780 \text{ m}}{20 \text{ min}} \times 75 \text{ min} = 70425$$

$$\frac{1502000 \text{ cm}}{20 \text{ min}} \times \frac{1 \text{ m}}{100 \text{ cm}} = \frac{15020 \text{ m}}{20 \text{ min}} \times 75 \text{ min} = 56325$$

Answer  $1.41 \times 10^4$  meters

$$\begin{array}{r} 70425 \\ -56325 \\ \hline 14100 \end{array}$$

### Test 2—Question 6 Score Point 3

This response matches the exemplary response contained in the rubric. The student shows a correct complete process and the correct answer of  $1.41 \times 10^4$  meters. The response receives a Score Point 3.

### SCORE POINT 2

6

The fastest whale can swim  $1.878 \times 10^6$  centimeters in 20 minutes. The fastest dolphin can swim  $1.502 \times 10^6$  centimeters in 20 minutes.

At these speeds, how many more METERS can the fastest whale swim than the fastest dolphin in 1 hour and 15 minutes?

Show All Work

don't  
divide >  
them  
Subtract  
them

$$\begin{array}{l} (1.878 \times 10^6) 3\frac{3}{4} = 7.035 \times 10^6 \\ (1.502 \times 10^6) 3\frac{3}{4} = 5.6325 \times 10^6 \\ 70350 - 56325 = 14025 \end{array}$$

Answer 14025 meters

### Test 2—Question 6 Score Point 2

This response shows a correct complete process. However, a computational error is made when the student multiplies  $1.878 \times 10^6$  by  $3\frac{3}{4}$ , resulting in an incorrect answer of 14,025 meters instead of 14,100 meters. Therefore, this response receives a Score Point 2.

### Test 2—Question 6 Score Point 1

This response shows an incorrect answer and an incomplete process. However, the student shows a correct process for converting the distances the whale and dolphin travel in 20 minutes from centimeters to meters. Therefore, this response receives a Score Point 1.

SCORE POINT 1	
<b>6</b>	<p>The fastest whale can swim <math>1.878 \times 10^6</math> centimeters in 20 minutes. The fastest dolphin can swim <math>1.502 \times 10^6</math> centimeters in 20 minutes.</p> <p>At these speeds, how many more METERS can the fastest whale swim than the fastest dolphin in 1 hour and 15 minutes?</p> <p style="text-align: center;"><b>Show All Work</b></p> <div style="text-align: right; margin-right: 50px;"> <math>1,878,000 \text{ cm} = 18780 \text{ m}</math>  <math>1502000 \text{ cm} = 15020 \text{ m}</math> </div> <p style="text-align: right; margin-right: 50px;">Answer <u>3760</u> meters</p>

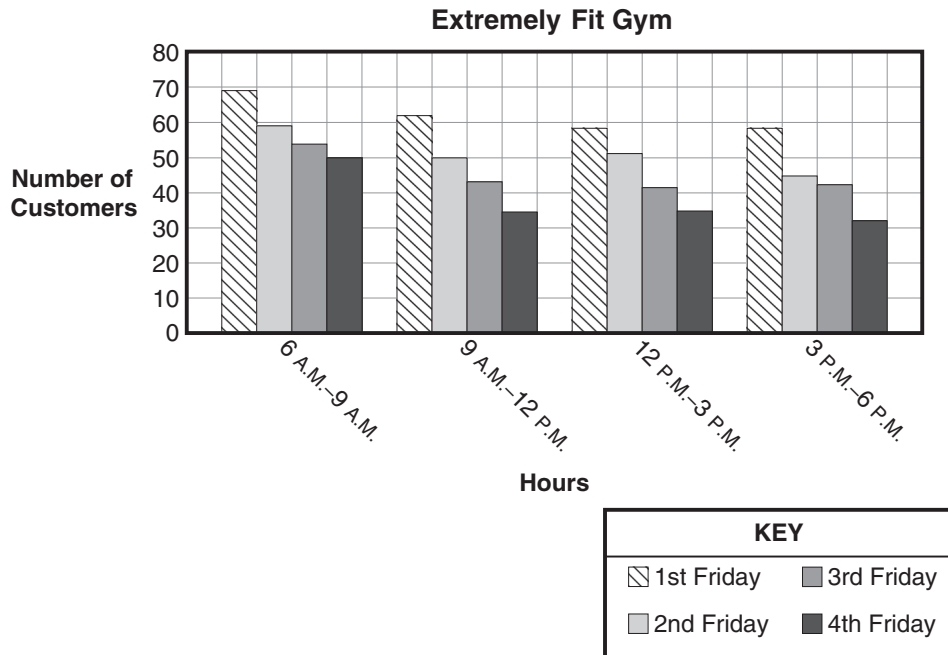
### Test 2—Question 6 Score Point 0

This response shows an incorrect answer and an incorrect process. Therefore, this response receives a Score Point 0.

SCORE POINT 0	
<b>6</b>	<p>The fastest whale can swim <math>1.878 \times 10^6</math> centimeters in 20 minutes. The fastest dolphin can swim <math>1.502 \times 10^6</math> centimeters in 20 minutes.</p> <p>At these speeds, how many more METERS can the fastest whale swim than the fastest dolphin in 1 hour and 15 minutes?</p> <p style="text-align: center;"><b>Show All Work</b></p> <div style="text-align: right; margin-right: 50px;"> <math>1.878 \cdot 100 = 187.8</math>  <math>1.502 \cdot 100 = 150.2</math>  <math>187.8 \times 10^6 = 1.878</math>  <math>150.2 \times 10^6 = 1.502</math>  <div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: right; margin-right: 10px;"> <math>\begin{array}{r} 1.878 \\ - 1.502 \\ \hline .376 \end{array}</math> </div> <div style="text-align: right;"> <math>\begin{array}{r} 11 \\ 1.128 \\ + .094 \\ \hline 1.222 \end{array}</math> </div> </div> </div> <p style="text-align: right; margin-right: 50px;">Answer <u>1.222</u> meters</p>

## Test 2—Question 7: Data Analysis and Probability

- 7** The graph below shows the number of customers who exercised at Extremely Fit Gym during different times of the day every Friday in October.



According to the graph, what time period of the day did the greatest number of customers exercise at the gym?

**Answer** \_\_\_\_\_

On the lines below, describe the trend that occurred from the first Friday to the fourth Friday during the month of October.

---



---



---



---

**Exemplary Response:**

- 6 A.M. to 9 A.M.

AND

Explanation equivalent to the following:

- The number of customers that visited the gym decreased from the first Friday to the fourth Friday in each time period.

OR

- Other valid explanation

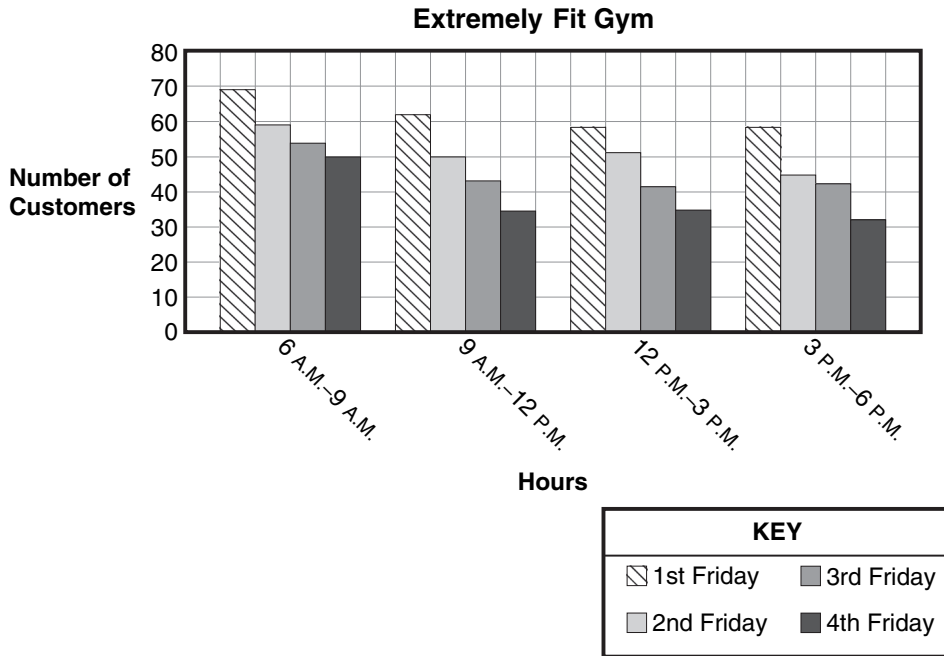
**Rubric:**

<b>2 points</b>	Exemplary response
<b>1 point</b>	One correct component
<b>0 points</b>	Other



## SCORE POINT 2

- 7** The graph below shows the number of customers who exercised at Extremely Fit Gym during different times of the day every Friday in October.



According to the graph, what time period of the day did the greatest number of customers exercise at the gym?

**Answer** 6 a.m.-9 a.m.

On the lines below, describe the trend that occurred from the first Friday to the fourth Friday during the month of October.

From the 1st Friday to the 4th Friday, the number of  
customers starts to decline at every time interval.

## Test 2—Question 7 Score Point 2

This response matches the exemplary response contained in the rubric. The student shows the correct answer of 6 A.M.–9 A.M. and gives a correct explanation. The response receives a Score Point 2.

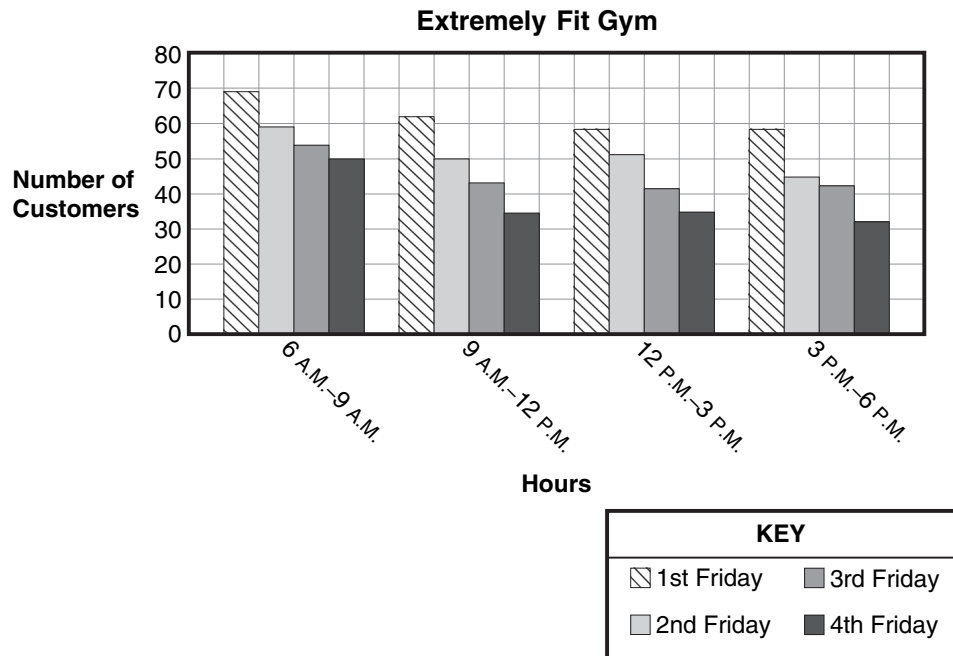
## Test 2—Question 7

### Score Point 1

This response shows a correct answer of 6 A.M.–9 A.M. and an incorrect explanation. The student compares only the first Friday and the fourth Friday instead of describing a trend from the first Friday to the fourth Friday in the month of October. Therefore, this response receives a Score Point 1.

### SCORE POINT 1

- 7** The graph below shows the number of customers who exercised at Extremely Fit Gym during different times of the day every Friday in October.



According to the graph, what time period of the day did the greatest number of customers exercise at the gym?

70-60-55-50

**Answer** 6 A.M.–9 A.M.

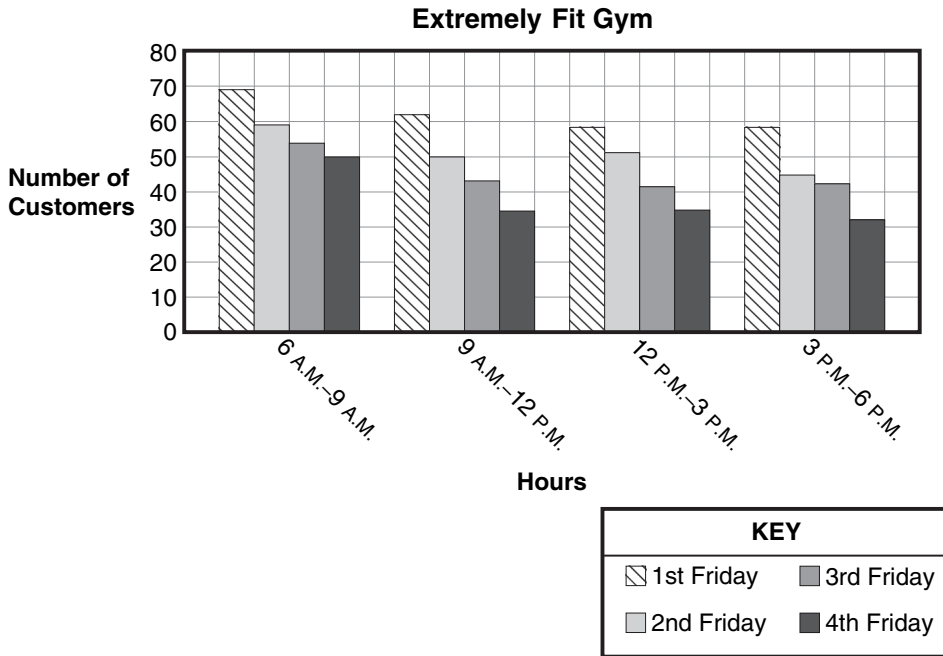
-20ish

On the lines below, describe the trend that occurred from the first Friday to the fourth Friday during the month of October.

Fewer people came at 6am-9am on the last Friday of October  
than on the first Friday. It went from about 70 to 50.

### SCORE POINT 0

- 7** The graph below shows the number of customers who exercised at Extremely Fit Gym during different times of the day every Friday in October.



According to the graph, what time period of the day did the greatest number of customers exercise at the gym?

**Answer** 1<sup>st</sup> Friday

On the lines below, describe the trend that occurred from the first Friday to the fourth Friday during the month of October.

The customer ratings steadily decrease in each new time zone.

They also decrease by day slightly until the afternoon rolls  
around and customers are back.

### Test 2—Question 7 Score Point 0

This response shows an incorrect answer and an incorrect explanation. Therefore, this response receives a Score Point 0.

## Test 2—Question 8: Problem Solving

8



Rubin's car gets 25 miles per gallon. He drove 75 minutes to his aunt's house. When Rubin returned home, he took a different route that took 15 minutes longer. He drove at an average rate of 60 miles per hour both going and returning.

How many MORE gallons of gasoline did Rubin use returning home than driving to his aunt's house? Use the formula below to help determine your answer.

$$\text{Miles per gallon} = \frac{\text{Distance traveled}}{\text{Number of gallons}}$$

**Show All Work**

**Answer** \_\_\_\_\_ gallons

**Exemplary Response:**

- 0.6 gallons

AND

- Correct complete process

Sample Process:

- Trip to aunt's house

$$d = rt$$

$$d = 60(1.25)$$

$$= 75 \text{ miles}$$

$$g = \frac{75}{25}$$

$$= 3 \text{ gallons used}$$

Trip back home

$$d = 60(1.5)$$

$$= 90 \text{ miles}$$

$$g = \frac{90}{25}$$

$$= 3.6 \text{ gallons used}$$

$$3.6 - 3 = 0.6 \text{ gallons}$$

OR

- Other valid process

**Rubric:**

**3 points** Exemplary response

**2 points** Correct answer only  
OR

Correct complete  
process; error in  
computation

**1 point** Correctly determines  
gallons of gas used  
on trip to aunt's  
house

OR

Correctly determines  
gallons of gas used  
on return trip

**0 points** Other

**Test 2—Question 8**  
**Score Point 3**

This response matches the exemplary response contained in the rubric. The student shows a correct complete process and the correct answer of 0.6 gallons. The response receives a Score Point 3.

**SCORE POINT 3**

**8**



Rubin's car gets 25 miles per gallon. He drove 75 minutes to his aunt's house. When Rubin returned home, he took a different route that took 15 minutes longer. He drove at an average rate of 60 miles per hour both going and returning.

How many MORE gallons of gasoline did Rubin use returning home than driving to his aunt's house? Use the formula below to help determine your answer.

$$\text{Miles per gallon} = \frac{\text{Distance traveled}}{\text{Number of gallons}}$$

**Show All Work**

$$\begin{aligned} d &= rt \\ d &= (60)(1.25) \\ d &= 75 \text{ miles} \end{aligned}$$

$$\frac{75\text{min.}}{60\text{min}} \left| \frac{1\text{hr}}{60\text{min}} \right. = 1.25$$

$$\begin{aligned} g &= \frac{75}{25} & d &= rt \\ g &= 3 & d &= (60)(1.5) \\ & & d &= 90\text{miles} \end{aligned}$$

$$\frac{90\text{min}}{60\text{min}} \left| \frac{1\text{hr}}{60\text{min}} \right. = 1.5$$

**Answer** 0.6 gallons

$$\begin{aligned} g &= \frac{90}{25} & 3.6 \\ &= 3.6 & - 3.0 \\ & & \hline & 0.6 \end{aligned}$$

## SCORE POINT 2

8



Rubin's car gets 25 miles per gallon. He drove 75 minutes to his aunt's house. When Rubin returned home, he took a different route that took 15 minutes longer. He drove at an average rate of 60 miles per hour both going and returning.

How many MORE gallons of gasoline did Rubin use returning home than driving to his aunt's house? Use the formula below to help determine your answer.

$$\text{Miles per gallon} = \frac{\text{Distance traveled}}{\text{Number of gallons}}$$

### Show All Work

25 mpg                      75 min  
15 min longer

60 mph

Answer       .6       gallons

## Test 2—Question 8 Score Point 2

This response shows a correct answer only. Therefore, this response receives a Score Point 2.

**Test 2—Question 8**  
**Score Point 1**

This response shows an incorrect answer on the answer line. However, the student correctly determines the number of gallons of gasoline used on the return trip. Therefore, this response receives a Score Point 1.

**SCORE POINT 1**



Rubin's car gets 25 miles per gallon. He drove 75 minutes to his aunt's house. When Rubin returned home, he took a different route that took 15 minutes longer. He drove at an average rate of 60 miles per hour both going and returning.

How many MORE gallons of gasoline did Rubin use returning home than driving to his aunt's house? Use the formula below to help determine your answer.

$$\text{Miles per gallon} = \frac{\text{Distance traveled}}{\text{Number of gallons}}$$

**Show All Work**

$$\begin{aligned}x \cdot 25 &= \frac{90}{x} \cdot x \\ \frac{25x}{25} &= \frac{90}{25} \\ x &= 3.6\end{aligned}$$

**Answer** 3.6 gallons



**SCORE POINT 0****8**

Rubin's car gets 25 miles per gallon. He drove 75 minutes to his aunt's house. When Rubin returned home, he took a different route that took 15 minutes longer. He drove at an average rate of 60 miles per hour both going and returning.

How many MORE gallons of gasoline did Rubin use returning home than driving to his aunt's house? Use the formula below to help determine your answer.

$$\text{Miles per gallon} = \frac{\text{Distance traveled}}{\text{Number of gallons}}$$

**Show All Work**

$$\begin{array}{r} 75 \\ + 15 \\ \hline 90 \end{array}$$

$$\begin{array}{r} 90 \\ + 25 \\ \hline 115 \end{array}$$

Answer 115 gallons

**Test 2—Question 8  
Score Point 0**

This response shows an incorrect answer and an incorrect process. Therefore, this response receives a Score Point 0.

**CTB/McGraw-Hill**  
20 Ryan Ranch Road  
Monterey, California 93940-5703  
800.538.9547 | [www.ctb.com](http://www.ctb.com)



*The McGraw-Hill Companies*

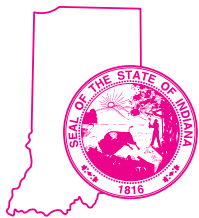
# Teacher's Scoring Guide

# Graduation Qualifying Exam Retest

## Mathematics

## Applied Skills Assessment

## Spring 2008



Indiana Department of Education